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PATENT

Attorney Reference Number 4630-61733
Application Number 10/044,671

Listing of Claims

1. (Currently Amended): A method of detecting ivermectin sensitivity in a canine subject, comprising determining whether a gene-truncation mutation in a *mdr1*-encoding sequence of the canine subject is present in the canine subject, wherein the gene truncation mutation is a deletion of four base pairs at about residue 294-297 of SEQ ID NO: 1, wherein presence of the gene-truncation mutation indicates that the canine subject is sensitive to ivermectin.

2. through 3. (Canceled)

4. (Currently Amended): The method of claim 1, wherein the method is used to evaluate whether the canine subject can be treated safely with ivermectin or another drug that can be excluded from a cell or an organ by P-gp.

5. (Currently Amended): The method of claim 4, wherein the method is used to evaluate whether the canine subject can be treated safely with ivermectin or another drug that can be excluded from the brain by P-gp.

6. (Currently Amended): The method of claim 1, further comprising determining whether the canine subject is homozygous or heterozygous for the gene-truncation mutation.

7. (Currently Amended): The method of claim 1, wherein determining whether a gene-truncation mutation is present in the canine subject comprises subjecting DNA or RNA from the subject to amplification using oligonucleotide primers.

8. (Original): The method of claim 6, comprising an oligonucleotide ligation assay.

9. (Currently Amended): The method of claim 1, comprising:

obtaining a test sample of DNA containing a *mdr1* sequence of the canine subject; and

determining whether the *mdr1* sequence of the canine subject has the gene-truncation mutation in the *mdr1* sequence,

wherein the presence of the mutation indicates sensitivity of the canine subject to ivermectin.

10. (Currently Amended): The method of claim 9, wherein determining whether the *mdr1* sequence of the canine subject has the mutation comprises using restriction digestion, probe hybridization, nucleic acid amplification, or nucleotide sequencing.

11. (Currently Amended): The method of claim 1, comprising:

obtaining from the canine subject a test sample of DNA ~~comprising an *mdr1* sequence~~;

contacting the test sample with at least one nucleic acid probe for the *mdr1* gene truncation mutation that is associated with ivermectin sensitivity, to form a hybridization sample;

maintaining the hybridization sample under conditions sufficient for specific hybridization of the *mdr1* sequence with the nucleic acid probe; and

detecting whether the *mdr1* sequence specifically hybridizes with the nucleic acid probe, wherein specific hybridization of the *mdr1* sequence with the nucleic acid probe indicates ivermectin sensitivity of the canine subject.

12. (Original): The method of claim 10, wherein the probe is present on a substrate.

13. (Original): The method of claim 12, wherein the substrate is a nucleotide array.

14. through 42. (Canceled)